THE SCHOBER REVERBATAPE UNIT RV-3A

INSTALLATION IN SCHOBER ORGANS

This instruction manual tells you how to mount your completed Reverbatape Unit RV-3A in a Schober Organ and how to adjust it for correct operation. Note that these instructions apply only for Schober Organs. Installation in other organs and equipment is covered in separate instructions which are supplied when needed.

The following connection and mounting parts are supplied, packed with other kit parts or in a separate container.

QUAN	DESCRIPTION	NUMBER
1	Control plate	0918
1	3/8-32 hex nut	0829
1	3/8 lockwasher	0839
2	No. 6 x 5/8 wood screws	087321
1	Control decal, gold (black furnished on request)	
1	Control knob	1204
2	Shielded cables with molded-on phono plugs	07609
1	Male phone plug	10102
1	Female cable-type phone jack	10100
2	Mounting brackets	0919
8	Rubber grommets to fit 3/8-inch hole	08910
4	3/16-inch-long tubular spacers	0843
4	1/4-inch-long tubular spacers	0841
8	1/2-inch-diameter flat washers	0854
4	6-32 x 1/2 hex-head self-tapping screws	08016
4	No. 6 x 7/8 wood screws	087314

While all Schober Organ installations are basically similar, there are small differences. The following numbered steps cover all the operations. However, before proceeding with each step, refer to the section later in this manual which covers the particular Schober Organ model you have. In the section on specific organs, the steps under each model have numbers corresponding with those in the main section below, and they give further details.

For example, suppose you have a Schober Recital Organ. Begin with step 1 in the General Installation Steps section. It tells you how to drill a hole in the organ stop board for the Reverbatape Control. Refer *at the same time* to step 1 under Schober Recital Organ. That tells you *where* to drill the hole. If you find a numbered step in the General section but no step with that number under your own model, it means that the General step applies entirely to your model.

GENERAL INSTALLATION STEPS

If you have an organ other than the Theatre Organ which contains a Mixer-Compressor, read the section of the Mixer-Compressor instructions which pertains to Reverbatape Unit installation before beginning the steps below. The following steps assume you do not have a Mixer-Compressor; if you do have one, certain details of cables and connections are different. The Mixer-Compressor instructions tell you about this.

It may not be necessary for you to drill the Control hole specified in steps 1 and 2 below, as most modern Schober consoles have these holes already drilled and the decal installed. The hole is usually filled with a wood plug; if so, knock out the plug with a blunt object from the front of the organ.

Check off each step in the hollow square as you complete it. Remember to refer to the corresponding step under your own organ model before taking each specified action.

☐ 1. Drill a ⅝-inch-diameter hole in the organ stop board for the Reverbatape Control. Use a power drill and a flat wood bit if available and begin drilling on the front of the panel to avoid splintering the veneer. (For a slightly neater job, drill a 5/16-inch hole through the panel; then countersink ⅝ diameter and about ⅜ deep on the panel rear.)

☐ 2. Apply the Reverbatape Control decal over the hole. Immerse the decal in water for about 30 seconds. Slide the film containing the printing off the paper backing onto the wood. Carefully center it over the hole by using the concentric circles. When it is in position, blot it without moving it with a soft cloth such as a laundered handkerchief. Leave no air bubbles under the surface of the film. Let the decal dry thoroughly (at least 30 minutes in normal atmosphere). Then carefully cut away the film over the hole with a razor blade. (A black decal is available on request if you prefer it to the usual gold one.)

☒ 3. Find the flat steel plate measuring 1¾ × ¾ inches, with two small holes and one large one. Place a lockwasher over the brass threaded bushing of the Control; then pass shaft and bushing through the large center hole. Add a nut and tighten.

☒ 4. Pass the shaft and bushing through the hole in the wood from the rear. Center the shaft in the hole and hold the assembly in place while you mark on the wood through the two small holes in the plate. Mount the plate to the wood with two #6 × ⅝ wood screws, after first pricking guide holes in the wood at the points marked.

☒ 5. Turn the Control shaft fully counterclockwise. Then put the knob on the shaft. Hold it so that the skirt does not quite touch the wood and the indicator is pointing at the zero mark on the decal while you tighten the setscrew.

☒ 6. Tape the template of Fig. 2 inside the console in the position given for your organ. Punch four holes right through the paper into the wood at the centers of the four circled crosses. Deepen the holes as much as possible with an awl or icepick, or drill 1/16 holes. (If the other side of the wood is a visible exterior surface, be careful not to drill all the way through.) Make the holes as straight as possible, not at an angle.

☒ 7. Look at Fig. 3. Place a rubber grommet over one of the holes. Push a ¼-inch-long tubular spacer right through the grommet until it hits the wood. (Be sure you use the ¼-inch spacers, not those 3/16 inch long.) Place a ½-inch-diameter flat washer on top of this assembly. Then pass a #6 × ⅞ wood screw down through the assembly and tighten it all the way. Install similar assemblies at the remaining three locations.

☐ 8. Attach the two large steel mounting brackets to the sides of the Reverbatape Unit. Note that there are three pairs of holes on each side of the steel box, a horizontal pair near the bottom, a vertical pair near the center, and a horizontal pair near the top. Use the pair specified for your organ. In all cases, the flange at one end of each bracket must point inward, *toward the steel box.* Step 9 tells exactly how to mount each bracket

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9. Examine Fig. 1. First install a rubber grommet in each of the two round holes in the body of each bracket. Then push a 3/16-inch-long tubular spacer through the center of each gormmet, leaving the spacers entirely inside the grommets. Hold a bracket in position as indicated for your organ, with the grommets and spacers over the specified pair of holes in the Reverbatape Unit side. (Be sure the bracket flange is *toward* the steel box, and the flange end of the bracket is up, down, or rear, as specified for your organ. In Fig. 1 the flange is shown down, just by way of example.) Place a ½-inch-diameter flat washer over a 6-32 X ½ hex-head self-tapping screw. Pass the screw through the center of the tubular spacer and into the hole in the Reverbatape Unit. Using a ¼-inch nutdriver, drive the screw in, but do not tighten it. Now do the same with another screw and flat washer and the remaining bracket hole. Finally, tighten the screws normally, but do not use great strength, as it is possible to strip the holes in the Reverbatape Unit if you do. Mount the second bracket in the same way on the other side of the Unit.

10. Unscrew the plastic cap of your male phone plug (part of your installation kit, not the one originally used on the organ), Pass the free end of one of the two cables having a molded phono plug at the other end through the hole in the top of the cap, so that the threaded end of the cap is toward the free wire end of the cable. Remove and discard the two small screws from the plug's connection terminals.

11. Pass the twisted shield wire through the vacated screw hole in the long terminal to within ¼ inch of the outer cable insulation. Solder and clip off excess. Clip off the inner conductor so that the remaining length goes about ¼ inch past the hole in the short terminal. Then strip off about ¼ inch of inner insulation and solder the inner conductor to the short terminal. Replace the plug's cap; use a piece of tape or paper to mark the phono plug molded to the other end of this cable IN.

12. Unscrew the plastic cap of the female phone jack and pass the free end of your remaining cable with molded plug at one end through the cap, just as in step 10. Solder the shield wire to the hole in the long terminal and the center conductor to the short terminal. Let the cable itself lie in the trough formed by the two tabs at the end of the long terminal. Use pliers to fold over the tabs so as to clamp the cable. Replace the cap. Mark the plug end of this cable OUT.

13. Put the Reverbatape Unit down on the floor behind the organ. Install the tension arm and a tape according to the instructions which came with the mechanism. From now on, avoid handling the Unit roughly so the tension arm will not slam down on the tape. *Keep the Unit upright at all times when it is running.*

14. Connect the IN and OUT plugs to the IN and OUT jacks on the face of the Reverbatape Unit.

15. At this point, turn on the organ and play it to be sure that it is working correctly before the Reverbatape Unit is installed. It is also important to be sure that you have the organ adjusted so that its volume is what you want it to be. The best way to set up maximum volume is to have the organ preset volume controls adjusted so that the organ itself is putting out a little less than the maximum control settings would give, and then to turn down your amplifier's volume control to reduce the sound to what you want. Your Final Assembly Instructions (and possible the Operation and Service Manual) tell you how to adjust the preset volume control on the organ, and the Mixer-Compressor instructions (if you have this unit on a Recital or Consolette II Organ) tell you more. The idea is that the organ should put nearly, but not quite, its maximum signal into the Reverbatape Unit; you can then reduce this signal at the amplifier if, as usually happens, it is too much. Do all this adjusting before connecting the Reverbatape Unit.

NOTE: Your organ should be working fully satisfactorily before the Reverbatape Unit is installed because if it is not Reverbatape faults can be mistaken for those of the organ and *vice versa,* making for confusion in troubleshooting. Do not go beyond this point in installing the Unit unless the organ is in good working condition.

16. With the organ turned off, remove the amplifier cable plug from the organ output jack and plug it instead into the female jack on the end of the OUT cable. Insert the male phone plug at the end of the IN cable into the organ's output jack.

17. Plug the a.c. line cord of the Unit into the receptacle indicated for your organ.

18. Lead the thick cable from the Reverbatape Control to the Unit and insert the 7-pin plug into the CONTROL socket.

Adjustment Procedure

19. Set all organ controls to normal positions. Vibrato and Percussion should be off. Swell shoe(s) should be in the maximum-volume position.

20. Use a screwdriver through the holes in the Reverbatape front and set both INPUT CONTROL and OUTPUT CONTROL to minimum (fully counterclockwise).Turn these controls gently, without forcing. Now get an assistant to help you. One of you should be at the organ, the other at the Reverbatape Unit.

21. Turn on the organ and set up the stops for the loudest combination you are likely ever to use, but leave out the most sizzling strings and reeds. Turn the Reverbatape Control down to zero. Hold chords on both manuals and a low pedal note.

22. You will probably hear a little sound, but not much. Turn up the OUTPUT CONTROL until you hear the sound clearly but still at very much less than full volume. The organ should now work normally, but at much less volume than usual. Do not touch the organ or amplifier volume controls.

23. Temporarily unsolder one end of resistor 105. This is 220,000 ohms, connected to tubular terminals on the Unit's printed circuit.

24. Remove transistors 77 and 96 and put them aside. Turn the Reverbatape Control to maximum.

25. Locate the BIAS potentiometer 135 on the RV-3A printed circuit. Turn this control fully counterclockwise.

26. Turn on the organ and hold middle C, leaving the organ stops and controls where you put them in step 21.

27. Rotate the BIAS control *slowly* clockwise. As you do so, the sound volume increases. At a certain point the volume reaches maximum. For a very small amount of rotation of the control past this point the volume remains at maximum. Then still further rotation makes volume start to decrease.

28. Your task is to leave the BIAS control at the most clockwise position which still gives maximum volume—that is, just at the most clockwise portion of that small range of rotation over which volume remains at maximum. To prepare

for doing this, rotate the control a few times in this vicinity to get the feel of how rotation affects volume. Then, as carefully and exactly as you can, leave the control set at the most clockwise point where volume is just on the point of receding from maximum. The decrease in volume just after this point is slight so listen hard. If you set the control too far clockwise, you will not get maximum reverberation time.

NOTE: If you have a meter which will read the audio voltage at the amplifier output, you may wish to use it. The meter will show you the range of control rotation over which volume is at maximum. When you have found it, rotate the control through this range, then slightly farther clockwise—until the meter reads exactly 0.9 times the maximum reading. If you work carefully you really do not need the meter, but you may enjoy the psychological satisfaction of having made the adjustment theoretically perfect.

☒ 29. Replace transistors 77 and 96 in their sockets and reconnect the end of resistor 105.

☒ 30. Leave the Reverbatape Control at maximum. You will now have a very large reverberation time and if you try playing some music the effect will sound muddy. Do not mistake this muddiness, which is due to long holdovers of notes, for distortion in the procedure which follows.

Input Control Adjustment

Steps 31 through 33 below are very important and you should understand their purpose.

The principal source of unwanted noise in most tape recorders is hiss caused by the passing of the tape over the playback heads; this noise is amplified by the very high magnification built into the transistor circuits fed by each head. Additional noise—hiss, frying sounds, and hum—is generated by the circuitry itself, as in all electronic equipment. The reason this noise is not annoying in well designed and adjusted equipment of all kinds is that the desired signal—music or speech—is so much louder than the noise that the noise becomes insignificant by comparison.

There is a limit, however, to how much wanted signal you can put through any piece of equipment. Amounts above a certain point usually cause something to overload so that the quality of the sound suffers. In a tape recorder, there is only so much sound one can get on the tape before the magnetic heads and the tape itself overload and cause distortion.

The problem, then, is to adjust matters so that as much of the wanted signal as possible is put into the Reverbatape Unit from the organ, so that organ signal is much louder than the noise generated in the Unit, but not so much organ signal enters that the Unit overloads and distorts the sound.

This adjustment is made with the INPUT CONTROL. You will adjust the control so that the loudest combination of chords and stops you are ever likely to play will be enough so that it almost, but not quite, overloads the Unit. In this way you will be making the desired signal as much greater than the undesired noise as it can be, and the noise will then be as far in the background as possible when your amplifier is set to produce the volume you wish.

☐ 31. Play and hold the loud chords and pedal you set up in step 21. Turn the Reverbatape Control to MAX. Release all the keys and pedal. Listen carefully to *the reverberations—the slow decay of the sound.* If the sound *during the decay* and right from the beginning of the decay the instant you released the keys and pedal sounds clear and undistorted, turn the INPUT CONTROL slightly clockwise. Then play the same notes again for at least 1 second and release them. Again listen to the decay. If the sound is still clean, advance the control and try again. Keep on doing this until you find that after the control has been advanced to a certain point the sound during the decay begins to sound distorted—fuzzy, "dirty," broken up, gravelly, no longer clean. Go back and forth over this point until it is quite obvious to your ear that the character of the sound changes at a certain point in the rotation of the INPUT CONTROL. If the *volume* begins to approach its normal maximum, turn down the OUTPUT CONTROL. This will make sure you are not being confused by distortion in your amplifier or speaker system. You don't need high volume to detect distortion; quite the contrary.

NOTE: If you are unable to cause distortion even with the INPUT CONTROL at maximum, the output from the organ is not great enough. Try advancing its internal preset volume control(s). Be sure the swell shoe(s) are in maximum position. If you still cannot get distortion, turn off the organ and Reverbatape Unit and change resistor 2 on the Unit's printed circuit from 470,000 ohms to 100,000 ohms. Resistor 2 is mounted in tubular terminals to make the change easy. You can buy a resistor at any radio parts or service shop. Then go back and try again. Note well that if you do not find this distortion-point adjustment of the INPUT CONTROL, your Reverbatape Unit will be excessively noisy.

☒ 32. Now make a final determination of the exact position of the INPUT CONTROL which just barely causes distortion. Then back off the control just enough to remove the distortion. Try this as many times as necessary to be sure you are right. The object of the whole exercise is to leave the control turned up as high as possible without quite causing distortion in the reverberations heard just after keys are released. Leave the control in this position and do not touch it again unless for some reason it becomes necessary. There are almost always only two possible reasons. (a) You may for some reason alter the preset volume adjustments inside the organ. (b) You may find that you were not actually playing the loudest music possible during the original adjustment, and you later find something louder, which causes distortion.

☒ 33. Turn the Reverbatape Control down to zero again. Now adjust the OUTPUT CONTROL until you get the same volume you did before the Reverbatape Unit was installed. You can best do this by playing for a while and making readjustments until you are satisfied. The OUTPUT CONTROL can be readjusted at any time without upsetting anything. Just remember to leave the INPUT CONTROL alone!

Installation Inside Console

☐ 34. You are now ready to install the Unit in the console. First disconnect the IN, OUT, and CONTROL plugs.

☐ 35. Hold the Unit in your hands with the U-shaped cutouts in the bracket flanges over the mounting assemblies you installed in steps 6 and 7. Look at Fig. 4. Slip one bracket (for instance the left one in the drawing) onto its mating mounting assemblies by sliding the bracket flange over the rubber grommets in such a way that the grooves in the grommets are mated with the flange cutouts. The metal, in other words, is in the grooves of the grommets. Now pull the flange end of the other bracket away from the steel box and slip its U-shaped cutouts into the grooves of the two mating grommets. Push both bracket flanges toward the steel box to be

quite sure they are firmly held by the rubber grommets.

NOTE: If you should ever ship the organ, secure the Reverbatape Unit in place by placing a screw into the wood next to each bracket as shown in Fig. 5, so the bracket flanges cannot bounce out of the grommet grooves. Remove these screws for operation. Remember, too, to remove the tension arm if the organ or the Reverbatape Unit is shipped.

☐ **36.** Run the Control, IN, and OUT cables to the Unit by convenient routes and plug them in. Fold and tape any excess lengths and fasten them down for neatness.

SPECIFIC ORGAN INSTRUCTIONS

The following special notes pertain to installations in specific Schober Organs. In each case, the numbered paragraph is a modification or further detailed explanation of the step of the same number in the preceding General Installation Steps.

Recital Organ

Check your Mixer-Compressor instructions if you have one. If your Reverbatape Unit is equipped with a Two-Channel Adapter to take care of the optional 2-channel operation of the Recital Organ, check the Adapter instructions, too.

1. Drill the Control hole 3⅝ inches from top of stop board, centered between right end of Great tablet slot and ON-OFF switch. If using two Reverbatape Units for dual-channel operation, drill both holes 3⅝ inches from top of board, not less than 2 inches apart, located as above.

6. Tape template to toeboard (vertical panel beneath keyboards) with line A 12¼ inches from console floor and line B 7 inches from treble end of console. If using two Units, place template for second one with line A 20½ inches from console floor and line B 7 inches from treble end.

8. Mount brackets on center vertical pair of holes, with flanged ends toward rear of Unit.

17. Plug line cord into any unoccupied receptacle on organ power supply.

19. Adjust each Reverbatape Unit separately if two are used, playing only on the manual for the channel being adjusted and using a pedal with the lower left pedal switch in the position of the channel being used.

33. Adjustment of the OUTPUT CONTROLS if two Units are used must also take into account balance between the two channels, just as when Great and Swell preset volume controls on the Preamplifier-Vibrato Unit were originally set before the Reverbatape Units were installed.

Consolette II

Check your Mixer-Compressor instructions if you have one.

1. Drill Control hole 7 inches from treble end of stop board and 2 inches from top.

6. Tape template to undersurface of component board so that line B is 12 inches from treble end of organ and line A is 6 inches from rear edge.

8. Mount brackets to upper horizontal pair of holes, with flanged ends up.

17. Use any unoccupied a.c. outlet on power supply.

Spinet Organ

1. Drill Control hole halfway between power switch and end of stop board.

6. Place template on console floor with line B 6 inches from rear edge and line A 2¼ inches from treble end.

8. Mount brackets on lower horizontal pair of holes, with flanged ends down.

17. If a.c. receptacle on organ power supply is already used (for the power amplifier, for instance) procure a cube tap (ordinary household-type multiple receptacle) and plug it into the power supply outlet. Then plug both amplifier and Reverbatape Unit into the cube tap.

Theatre Organ

1. Control hole with decal is furnished on every console; console drawings show hole location for home builders. Hole on Schober-built consoles is filled with plug; knock out plug with blunt object from outside surface of stop board.

3, 4. Steel plate is not used. Pass shaft and bushing of Control through hole from rear, with terminals up. Lift stop board as necessary. On front add flat washer and large nut and tighten.

5. Snap off end of shaft at score mark. Just bend with pliers; it will break off clean.

6. Tape template to component board with line A 2⅜ inches from bass end of console (cutting off unneeded edge of paper to make it easy) and line B 5⅜ inches from rear edge of component board.

8. Mount brackets on lower horizontal pair of holes with flanges down.

10-12. Phone plug and jack are not used. Cut one cable down to 29 inches. Pass non-plug end up through all three screweyes CC. Strip the end. Solder the inner wire to terminal RI and the shield wire to terminal IS on the Mixer-Compressor printed circuit. Label the plug of this cable IN. Discard the other cable which came with the Unit, if any.

13. Install tension arm and tape. Put Unit down on bass end of component board, facing treble end.

IMPORTANT NOTE: After completing step 13, skip step 14 and go immediately to step 15. After step 15, go back to 14. Cross out step 16 entirely.

14. Connect IN plug to Unit. Remove OUT plug from jack on Mixer-Compressor and plug into Unit's OUT jack.

17. Run Unit line cord down through large hole in component board and under internal speaker enclosure to a receptacle on organ power supply.

22. After completing this step, turn Unit around so it faces bass end of organ.

29. At the end of this step turn the Unit around again so it faces the treble end of the organ.

34. Ignore this step.

36. Cables are already plugged in. Fold and tape slack in a.c. line cord so it cannot fall on the pedal switches.

Concert Model

1. Drill Control hole halfway between BRILLIANCE control and left end of stop board.

6. Place template on console floor with line B 8 inches from treble end and line A 4½ inches from rear edge.

8. Use lower horizontal pair of holes. Mount brackets with flanges down.

17. Put a cube tap (household-type multiple receptacle) into the outlet now occupied by the organ power supply line cord. Then plug power supply and Reverbatape Unit into the

cube tap. Do not use the outlet farthest from the power supply, as it is not turned off by the organ power switch.

18. Lead the Control cable down along the toeboard and over the pedal switches.

Consolette I With Metal Keyboards

1. Drill Control hole between power switch and end of stop board.

6. Tape template to undersurface of component board with line A 6 inches from rear edge of board and line B 12 inches from treble end.

8. Fasten brackets to upper horizontal pair of holes with flanges up.

17. Cut the plug off the Reverbatape Unit line cord. Pass wires through rubber grommet into organ power supply. Solder wires to same tie points as black transformer wires.

Consolette I With Wood Keyboards

1. Drill Control hole halfway between pilot light and end of stop board.

6. Place template on console floor, with line B 6 inches from rear edge and line A 2¼ inches from treble end.

8. Mount brackets on lower horizontal pair of holes with flanges down.

17. Cut plug off Reverbatape Unit line cord. Lead cord into organ power supply through rubber grommet. Solder wires to same tie points as black transformer wires.

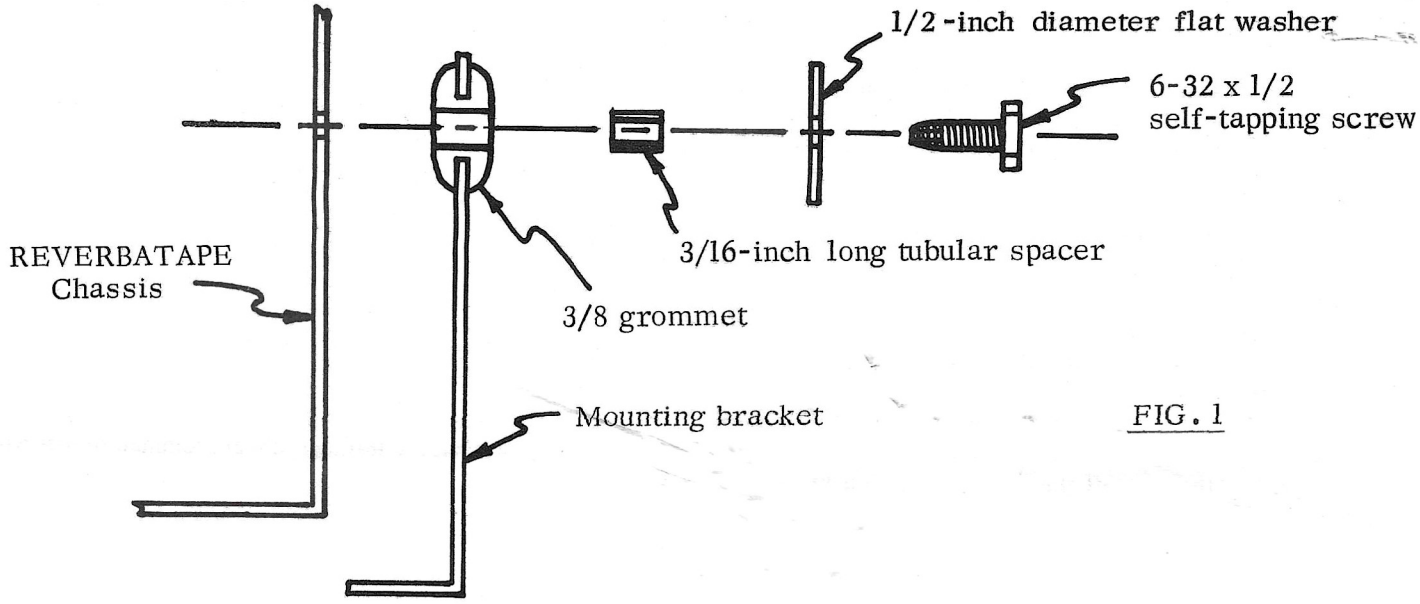


FIG. 1

FIG. 3

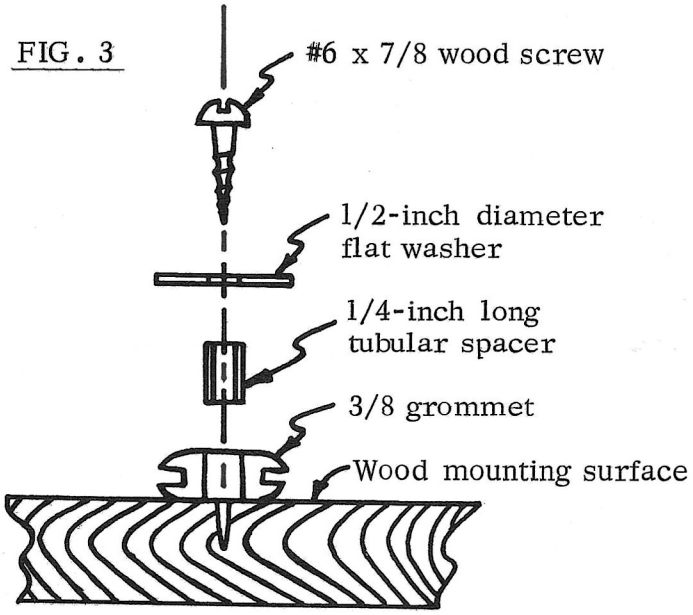
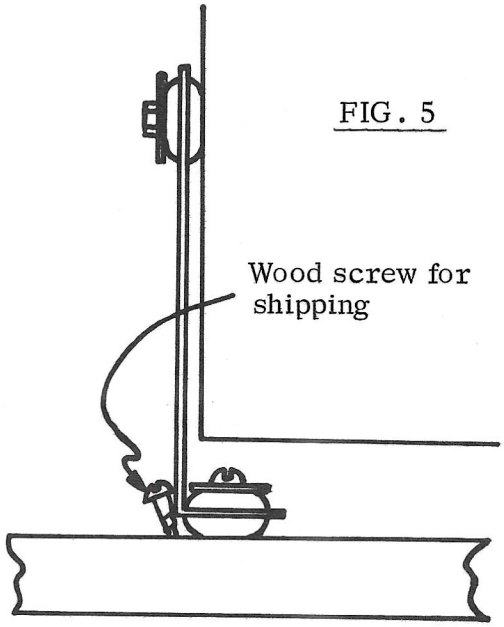


FIG. 5



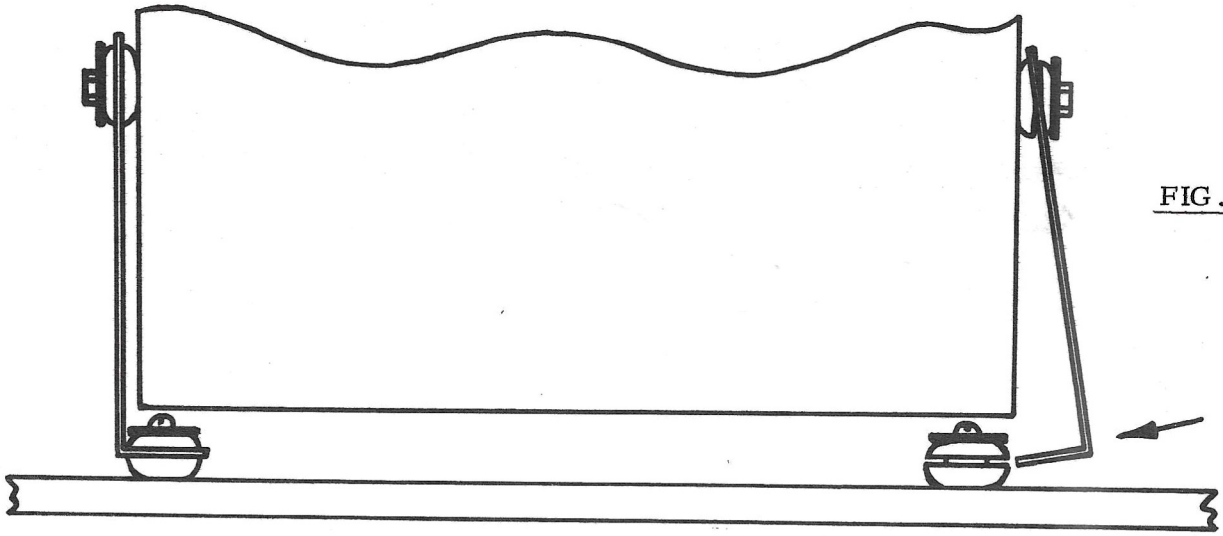


FIG. 4

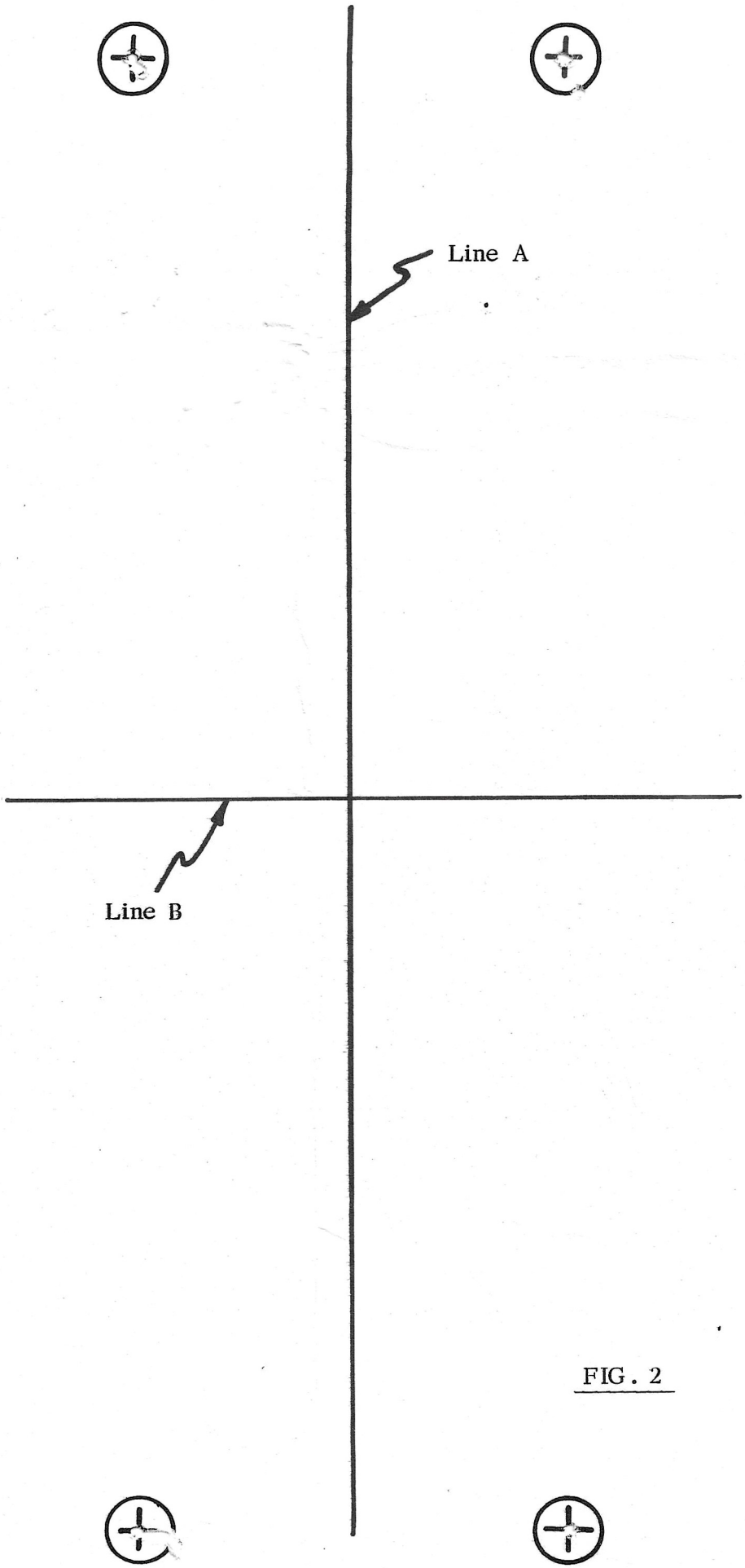


FIG. 2